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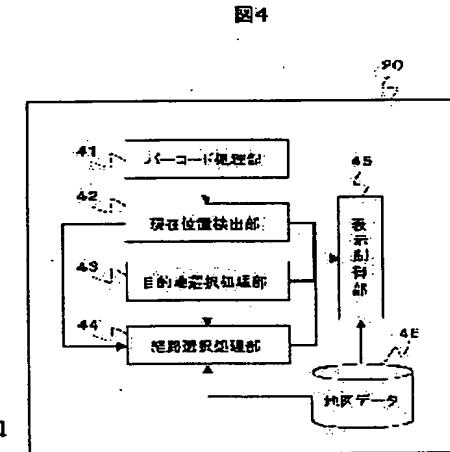
(54) PORTABLE INFORMATION PROCESSING APPARATUS AND NAVIGATION SYSTEM

(57) Abstract:

PROBLEM TO BE SOLVED: To provide a navigation system of a simple constitution which does not use a GPS-receiving device.

SOLUTION: Map data, on a predetermined service area, are stored in a map data storage part 46. Bar codes are pasted on columns and walls of buildings in the service area, and the bar codes indicate their locations. A bar code processing part 41 analyzes the bar codes read by a bar code reader provided for a portable terminal 20. A present location detecting part 42 detects the present location from the results of the analysis.

After a destination selection processing part 43 presents a menu to have a destination selected, a route selection processing part 44 specifies a route from the present location to the destination through the use of the map data.



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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention starts the navigation system guided to the destination, and relates to the navigation system performed in the area appointed especially beforehand.

[0002]

[Background of the Invention] The navigation system which shows and guides the route from the current position to the destination is widely used so that it may be represented by car navigation. A user inputs the conventional navigation system and the destination acquires the current position automatically by GPS (GlobalPositioning System) etc. That is, since the conventional navigation system using GPS needs to receive the signal of a satellite, it is the requisite to use it outdoors.

[0003] However, when a navigation system can be used also in indoor and the underground which the electric wave of a satellite does not reach, there are many convenient scenes.

[0004] Moreover, the conventional navigation system surely needed to carry the GPS receiving set in the equipment which a user carries. For this reason, if the current position can be grasped with equipment simpler than GPS, it will lead to the cost cut of the equipment which a user carries. When guiding the path to the destination in the area appointed especially beforehand, it is convenient if a general-purpose portable telephone and a general-purpose Personal Digital Assistant can be used.

[0005] Then, this invention aims at offering the navigation system of a simple configuration of not using a GPS receiving set.

[0006]

[Means for Solving the Problem] The pocket information processor according to one mode of this invention The map data of the area appointed beforehand, and the reader for reading the indicator in which it is arranged in said area and the arranged location is shown, A decision means to determine the path to said destination which the location which said indicator which said reader read shows based on the map data of said area to an input means to receive the input of the destination in said area, and said input means received, Based on the path which said decision means determined, it has an output means to output the information for guiding to said destination.

[0007] The information for guiding with a suitable operation gestalt to said destination which said output means outputs is voice.

[0008] The information for guiding with other suitable operation gestalten to said destination which said output means outputs is the path displayed a map image and on the image.

[0009] With a suitable operation gestalt, said indicator is a bar code and said reader is a bar code reader.

[0010] The navigation system according to one mode of this invention It is arranged in the location where it differs in the area appointed beforehand, and has two or more indicators in which said each arranged location is shown, and a personal digital assistant for a user to carry. Said personal digital assistant The map data of said area, and the reader for reading said indicator, A decision means to determine the path to said destination which the location which said indicator which said reader read shows to an input means to receive the input of the destination in said area, and said input means received, Based on the path which said decision means determined, it has an output means to output the information for guiding to said destination.

[0011]

[Embodiment of the Invention] Hereafter, the area navigation system concerning 1 operation gestalt of this invention is explained using a drawing.

[0012] The area navigation system concerning this operation gestalt is a system for guiding the user of

this system which is in the area (for example, an underground center, a department store, a shopping mall, a theme park, etc.) appointed beforehand to the destination. For example, the maps 10 shown in **drawing 1** are an entrance 11 and a schematic diagram whose 11 -- is those with four place, and the underground center where a path 12 and 12 -- passed in a grid pattern, the path was faced, and the store (not shown) is located in a line. The alphabet or a figure is assigned to each path 12 and 12 --, and these are used for the area number mentioned later. This system can be applied, for example to such an underground center.

[0013] In the system concerning the 1st operation gestalt of this invention, the information processor (henceforth a personal digital assistant) 20 of a pocket mold is lent to the user who enters an underground center (service area) from an entrance 11. A personal digital assistant 20 has a function which is explained below, and can guide a user to the destination. When leaving this service area, a user returns a personal digital assistant 20 at one of the entrances 11.

[0014] In the system concerning this operation gestalt, the area number by which every place in a service area are equivalent to the address which can pinpoint the location in a service area uniquely is assigned. Therefore, locations, such as a store in a service area, can be pinpointed by the area number. Moreover, the indicator is arranged in various places in a service area. This indicator shows the area number of that point, for example, is stuck on a wall, a column, etc. of a building in a service area. An example of the indicator 30 shown in **drawing 2** is the combination of the bar code 32 which contained as information the alphabetic character 31 which shows an area number, and its area number. An indicator is not limited to the combination of an alphabetic character and a bar code. For example, an indicator may be transposed to an alphabetic character, a figure, or a notation. Moreover, although the illustrated bar code is a 1-dimensional bar code, a two-dimensional bar code may be used.

[0015] Next, an example of the appearance of a personal digital assistant 20 is shown in **drawing3**. A user can receive the service which the system concerning this operation gestalt offers using a personal digital assistant 20. A personal digital assistant 20 is equipped with the display 21 for displaying the path to a menu screen which is mentioned later, and the destination displayed on the map image etc., the manual operation buttons 22 (22a, 22b, 22c, 22d) and 23 for an input which a user operates, and the bar code reader 24 which reads a bar code 32.

[0016]. **Drawing 4** is a functional block diagram for explaining the function which a personal digital assistant 20 has. Each component or function of the personal digital assistant 20 explained below is realized when CPU with which a personal digital assistant 40 is equipped and which is not illustrated performs a computer program.

[0017] The bar code processing section 41 which extracts the area number which a personal digital assistant 20 receives and processes the signal from a bar code reader 24, and is contained in a bar code, The current position detecting element 42 which receives an area number and detects the current position of a personal digital assistant 20, The destination selection processing section 43 as which display a menu screen on a display 21 and a user is made to choose the destination, Based on facility data, it has the routing processing section 44 which chooses the path to the destination from the current position, the display and control section 45 which controls a display 21, and the map data storage section 46 which memorized map data including the facility in a service area etc.

[0018] Next, it combines with actuation of a user and the processing which this personal digital assistant 20 performs is explained using drawings 3 to 6 .

[0019] First, if the power source of a personal digital assistant 20 is switched on, the current position detecting element 42 will display on a display 21 the message screen 51 to which reading of a bar code is urged to a user as shows **drawing 5 (a)**. In the message screen 51, the bar code reading carbon button 53 and the area number manual entry carbon button 54 other than a message 52 are contained. A user discovers the bar code stuck on the column or the wall, brings a bar code reader 24 close to the bar code, where the bar code reading carbon button 53 is chosen, he pushes a manual operation button 23, and he reads a bar code. If a bar code reader 24 reads a bar code, the information will be notified to the bar code processing section 41. The bar code processing section 41 analyzes the received information, and extracts the area number contained in the read bar code.

[0020] Moreover, if a manual operation button 23 is pushed where the area number manual entry carbon button 54 is chosen, the current position detecting element 42 will display the input screen 55 as shown in **drawing 5 (b)** on a display 21. An input screen 55 contains the alphabetic-character key for the input of an area number. A user moves a selection key with a manual operation button 22, and determines a selection key with a manual operation button 23. A user inputs the area number written with the bar code in the above-mentioned way.

[0021] The current position detecting element 42 pinpoints the current position from the area number in which the area number or user notified from the bar code processing section 41 did the manual entry.

[0022] Next, the destination selection processing section 43 displays the menu screen 60 as shown in drawing 6 on a display 21, and makes a user choose the destination. A user moves the selection field 65 with manual operation buttons 22a and 22c, and determines the destination with a manual operation button 23.

[0023] The routing processing section 44 receives a notice about the current position and the destination, respectively. And with reference to the map data storage section 46, the path from the current position to the destination is determined.

[0024] Each name and area number are matched and memorized by the map data storage section 46 about the facility for example, in a service area, the starting point of a path and a terminal point, the crossing, etc. The map data memorized by the map data storage section 46 can be added or updated.

[0025] A display and control section 45 displays a map on a display 21 combining the path and map data which were determined. The example of a display at this time is shown in **drawing 7**. Here, "*" shows the current position of the user who possesses the personal digital assistant 20, and "*" shows the destination. Thus, the path to the destination can be displayed in visible and a user can be guided to the destination.

[0026] Moreover, when leaving a service area for going home etc. after a user arrives at the destination and finishes business, the path to an entrance is guided. In this case, a user chooses an "entrance" in a menu screen 60. Since the current position is the last destination and the destination selection processing section 43 holds at this time, the input of the current position is ommissible. The routing processing section 44 is the directions from the destination selection processing section 43, and chooses and guides the path to an entrance.

[0027] By the system concerning this operation gestalt, it can guide to the destination in the area which was able to set the user beforehand by the simple system which does not use GPS.

[0028] Next, the 2nd operation gestalt of this invention is explained. This operation gestalt explains focusing on the point which is different from the 1st operation gestalt. Therefore, the same sign may be given to the same thing as the function or configuration explained with the above-mentioned operation gestalt, and explanation may be omitted.

[0029] With the 1st operation gestalt, although the personal digital assistant 20 only for these systems was used, in the 2nd and 3rd operation gestalten, the personal computer of a general-purpose portable telephone, a Personal Digital Assistant, or a pocket mold etc. is used.

[0030] The 2nd operation gestalt is equipped with the server 80 in which personal digital assistant 70 and personal digital assistant 70 communication link is possible as shown in **drawing 8**. A personal digital assistant 70 and a server 80 may be connected through the Internet etc.

[0031] A personal digital assistant 70 is equipped with the display and input key which are not illustrated, and has the communications control section 71 for considering data transmission and reception as a server 80, the input-process section 72, and a display and control section 45 as an internal function. A personal digital assistant 70 receives the service which accesses to a server 80 and a server 80 offers.

[0032] A server 80 has a personal digital assistant 70, the communications control section 81 which performs data transmission and reception, the current position detecting element 42, the destination selection processing section 43, the routing processing section 44, and the map data storage section 46. The current position detecting element 42 transmits the data for displaying the input screen 55 of an area number as shown in **drawing 5 (b)** from a personal digital assistant 70, corresponding to a demand to a personal digital assistant 70. Moreover, the destination selection processing section 43 transmits the data for displaying the menu screen 60 as shown in **drawing 6** according to a demand from a personal digital assistant 70 to a personal digital assistant 70. And based on the information which the user inputted, the current position and the destination are pinpointed like the 1st operation gestalt. And the routing processing section 44 also determines a path as well as the 1st operation gestalt. And the communications control section 81 transmits collectively the information and map data in which a path is shown to a personal digital assistant 70.

[0033] Moreover, the personal digital assistant 70 and server 80 concerning the 3rd operation gestalt are shown in **drawing 9**. A server 80 has the communications control section 81, the map data storage section 46, and the program store section 83 that memorized the personal digital assistant program required in order that a portable telephone etc. may operate as a personal digital assistant 70 of this system.

[0034] A personal digital assistant 70 is equipped with the communications control section 71, the input-

process section 72, and a display and control section 73 like the 2nd operation gestalt. The communications control section 71 downloads a personal digital assistant program from a server 80. By performing the downloaded personal digital assistant program by CPU which a personal digital assistant 70 does not illustrate, the current position detecting element 42, the destination selection processing section 43, and the routing processing section 44 are realized on a personal digital assistant 70. You may make it map data use them only for a required part, downloading. For example, only the map data for displaying a map on the map data which the routing processing section 44 uses for routing, and the indicating equipment which is not illustrated may be downloaded, and may be memorized and used for EEPROM which is not illustrated.

[0035] In addition, when there are two or more service areas, a server 80 may be installed for every service area, and you may make it one server 80 take charge of two or more service areas. When one set of a server 80 takes charge of two or more service areas, the map data of all charge service areas are memorized by the map data storage section 82. And when a personal digital assistant 70 accesses to a server 80, a server 80 receives selection of a service area first.

[0036] The user in the area beforehand appointed according to the 2nd and 3rd operation gestalten using the general-purpose portable telephone etc. can be guided to the destination.

[0037] The operation gestalt of this invention mentioned above is the instantiation for explanation of this invention, and is not the meaning which limits the range of this invention only to those operation gestalten. This contractor can carry out this invention in other various modes, without deviating from the summary of this invention.

[0038] For example, the communication link with a server 80 and a personal digital assistant 70 can realize either of mixing of wireless, a cable, wireless, and a cable, and the course guidance to the destination can realize it, even if it displays in visible on a map and also uses acoustic-sense-information, for example, voice.

[Translation done.]

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing 1. When the area navigation system concerning 1 operation gestalt of this invention is applied, it is the map of a suitable underground center.

[Drawing 2] Drawing 2. It is an example of an indicator 30.

[Drawing 3] Drawing 3. The appearance of a personal digital assistant 20 is shown.

[Drawing 4] Drawing 4. The functional block diagram of a personal digital assistant 20 is shown.

[Drawing 5] Drawing 5. The example of the screen displayed on a display is shown.

[Drawing 6] Drawing 6. The example of the screen displayed on a display is shown.

[Drawing 7] Drawing 7. It is the example which showed the path to the destination on the map.

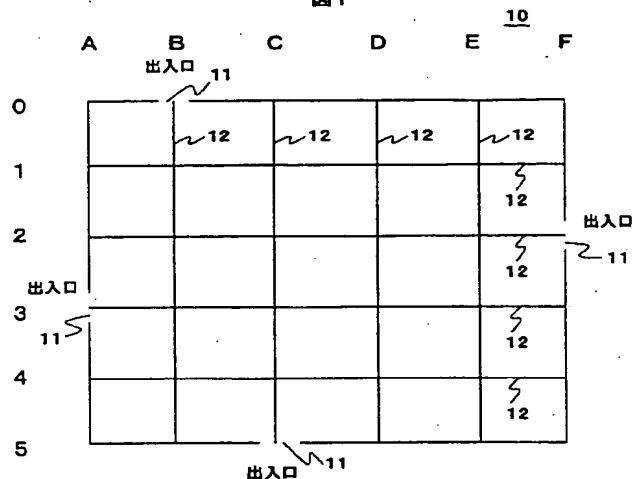
[Drawing 8] Drawing 8. They are the personal digital assistant 70 of the 2nd operation gestalt, and the functional block diagram of a server 80.

[Drawing 9] Drawing 9. They are the personal digital assistant 70 of the 3rd operation gestalt, and the functional block diagram of a server 80.

[Description of Notations]

10 [-- A manual operation button, 24 / -- A bar code reader, 30 / -- An indicator, 32 / -- A bar code, 51 / - A message screen, 55 / -- An input screen, 60 / -- A menu screen, 80 / -- Server.] -- 20 A map, 70 -- A personal digital assistant, 21 -- 22 A display, 23

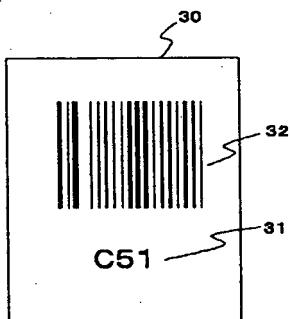
1



[Translation done.]



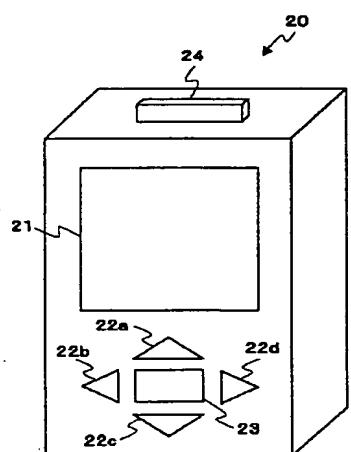
図2



[Translation done.]



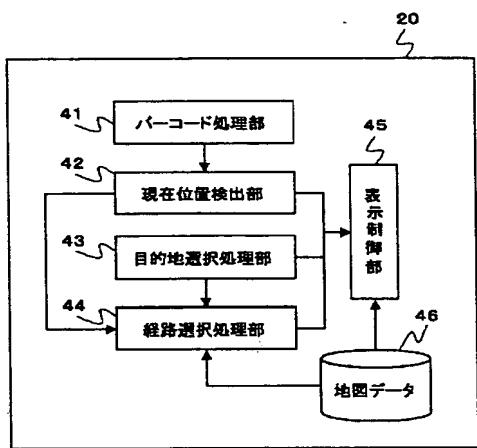
FIG 3



[Translation done.]



図4



[Translation done.]



図5

(a)

51

52

53

54

55

56

近くの柱または壁に貼
られているバーコードを読
んでください。

バーコード読み込み

エリア番号手入力

This diagram shows a user interface for reading a barcode. It consists of a large rectangular area with a barcode at the top left. Inside this area, there is a text box containing Japanese text: '近くの柱または壁に貼られているバーコードを読んでください.' (Please read the barcode attached to the pillar or wall). Below the text box are two rectangular buttons: one labeled 'Barcode reading' and another labeled 'Area number input'. There are also some small numbers (51-56) scattered around the interface.

(b)

56

現在位置(エリア番号)は?

C-5_

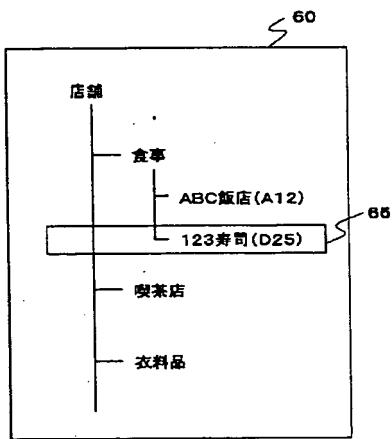
A	B	C	D
0	1	2	3
4	5	6	7
8	9		

This diagram shows a keypad interface for entering an area number. At the top, it asks '現在位置(エリア番号)は?' (What is your current position? Area number). Below this is a sample entry 'C-5_'. The keypad itself is a 4x4 grid of buttons. The first row contains buttons labeled 'A', 'B', 'C', and 'D'. The second row contains buttons labeled '0', '1', '2', and '3'. The third row contains buttons labeled '4', '5', '6', and '7'. The fourth row contains buttons labeled '8', '9', and two empty spaces. There are also small numbers (56) scattered around the keypad.

[Translation done.]



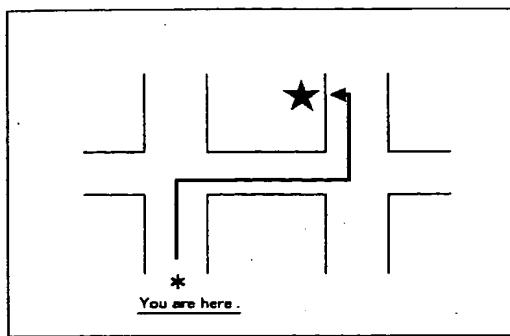
图6



[Translation done.]



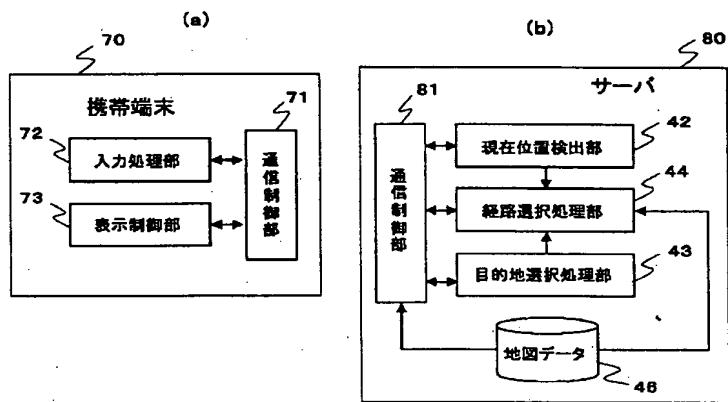
图7



[Translation done.]

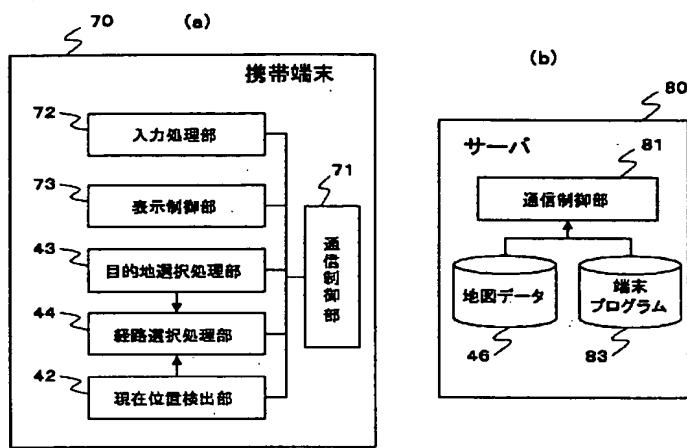


図8



[Translation done.]

図9



[Translation done.]

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